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EXAMINER

TADESSE, YEWEBDAR T

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/743,928

Applicant(s)

NGUYEN, ANDREW P.

Examiner

Yewebdar T. Tadesse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 22-24 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-21 is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 05122005.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of group I in the reply filed on 10/17/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 22-24 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/17/2005.

### *Claim Objections*

3. Claims 2, 16 and 21 are objected to because of the following informalities: in claim 2 applicant claims, "the inlet opening **is a first height** above the bottom of the passageway, the at least one outlet opening **is a second height** above the passageway, the second height being less than the first height, and the drain opening **is a third height** above the bottom of the passageway" and in claims 16 and 21, lines 7-10 each applicant claim, " **an inlet opening a first height** above the bottom piece, **at least one outlet opening (a plurality of outlet openings) a second height** above the bottom piece, the second height being less than the first height, a plurality of nozzles, each being connected to a respective outlet opening, **a drain opening a third height** above the bottom piece". These claims are grammatically incorrect, where the phrases

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are in bold font style as shown above. For the purpose of examination, “the inlet opening is [at] a first height above the bottom of the passageway, the at least one outlet opening is [at] a second height above the passageway, the second height being less than the first height, and the drain opening is [at] a third height above the bottom of the passageway” and “an inlet opening [at] a first height above the bottom piece, at least one outlet opening (a plurality of outlet openings) [at] a second height above the bottom piece, the second height being less than the first height, a plurality of nozzles, each being connected to a respective outlet opening, a drain opening [at] a third height above the bottom piece”. Appropriate correction is required.

4. Examiner also advises the applicant to make corrections of these minor grammatical informalities related to the height of the openings of the head throughout applicant’s specification in similar manner as described above (see Abstract, page 4, page 6 and others). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claims 2-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 2, lines 2-3 it is unclear by claiming, “the at least one outlet opening is at a second height **above the passageway**”. As shown in

Fig 4a, the outlet opening (50) is not disposed above the passageway (42). For the purpose of examination "the at least one outlet opening is at a second height above the bottom of the passageway".

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1 and 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al (US 2002/0121341 A1).

With respect to claim 1, Tanaka et al discloses (see Fig 53) a system comprising: a dispense head (630) having a passageway (634) therethrough, an inlet opening (638, 642), at least one outlet opening (632), and a drain opening (640, 644), the passageway (634) interconnecting the inlet opening, the at least one outlet opening, and the drain opening; a first valve (648, 668) connected to the inlet opening; and a second valve (652, 672) connected to the drain opening, a fluid flowing into the inlet opening, through the passageway, and out of the at least one outlet opening when the first valve is open and the second valve is closed, the fluid flowing from the passageway out of the drain opening when the first valve is closed and the second valve is open.

As to claim 11, Tanaka et al discloses (see Fig 53) a system comprising: a

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dispense head (630) having a passageway (634) therethrough, an inlet opening (638, 642) at least one outlet opening (632), and a drain opening (640, 644), the passageway (634) interconnecting the inlet opening, the at least one outlet opening (632), and the drain opening (640, 644); a first valve (648, 668) connected to the inlet opening; a second valve (652, 672) connected to the drain opening; and a pump (664, 682) having a low pressure side and a high pressure side, the low pressure side being connected to the second valve, a fluid flowing into the inlet opening, through the passageway, and out of the at least one outlet opening when the first valve is open and the second valve is closed, the fluid flowing from the passageway out of the drain opening when the first valve is closed and the second valve is open.

As to claim 12, in Tanaka et al (see Fig 53) no fluid flows from the passageway out of the outlet opening when the first valve is closed and the second valve is open.

Regarding claim 13, in Tanaka et al (see Fig 53) the drain opening is adjacent to the bottom of the passageway.

### ***Claim Rejections - 35 USC § 102/103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 14-15 are rejected under 35 U.S.C. 102(b) as anticipated by Tanaka et al (US 2002/0121341 A1) or, in the alternative, under 35 U.S.C. 103(a) as unpatentable over Tanaka et al (US 2002/0121341 A1) as applied to claim 13 above and further in view of Nagamine (US 2002/0053319).

As to claim 14, Tanaka et al discloses (see Figs 49-50) substrate support (610) and a dispensing head (630) connected to the pots (620, 622) that appear to have frame structures and the head is suspended in a selected position relative to the substrate. In any event, it is well known in the art to attach a dispense head and a substrate support to a frame; for instance Nagamine discloses (see Fig 6) a frame (15), wherein the dispense head (nozzle 100) and the substrate support (spin chuck 71) are connected to the frame and the head is suspended in a selected position relative to the substrate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a frame connected to the substrate support and the dispense head in Tanaka et al to appropriately mount the application devices in a deposition or processing unit that are necessary for treatment of a substrate.

With respect to claim 15, in Tanaka et al (see Fig 53) the first valve (648,668) is

open and the second valve (652, 672) is closed, the fluid flows into the inlet opening (638, 642), through the passageway (634), out of the at least one outlet opening (632), and onto the semiconductor substrate.

***Allowable Subject Matter***

12. Claims 16-21 are allowed.

13. Claims 2-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: Tanaka et al as shown in Fig 53 does not disclose a drain opening at a height less than the height at which the outlet opening is located relative to the bottom of the passageway (the bottom piece). Mitsuhashi et al (US 5,962,070) discloses (see Fig 8A) a nozzle (9) having discharge openings that appear to be at a height above the bottom of the nozzle body. However, Mitsuhashi et al does not disclose a nozzle body having a drain opening. Jones et al (US 5,435,885) discloses (see Fig 1, column 5, lines 1-5 and column 13, lines 50-61) fluid flow manifold (2) provided with a drain conduit (30). In Jones et al the height arrangement of the openings within the passageway or the positioning of the second outlets (injectors 6,8, 10, 12) relative to the drain conduit is not clear. Even if the drain conduit (30) is considered to be positioned at the lowest height



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from the bottom of the passageway compared to the inlet and outlet openings. There would not have been motivation to modify the apparatus shown by Mitsuhashi et al with drain opening at a height as claimed because Jones teaches (see column 5, 1-9) that the drain is used to remove excess fluid from the surface of the substrate, wherein the jets are submerged into the filling space of the substrate. Whereas, in Mitsuhashi et al no excess coating removal from the substrate or submersion of spray head or jet is taught. Actually, Mitsuhashi discloses (see column 9, line 51-column 10, line 6) that a predetermined amount of developer is supplied to the wafer. Mitsuhashi et al also teaches (see column 6, line 67-column 7, line 2) that nozzle having such construction (see Fig 8A) prevents problems related to the formation of bubbles in the passages of the nozzle, and the nozzle body provided with thin passage (50) having strong surface tension, which prevent the dripping of the developer from discharge nozzle (see column 10, lines 7-18) –addressing the dripping problem of the nozzle body or dispense head (similar problem discussed in applicant's invention, see title of the invention). However, Mitsuhashi et al (as explained above) dose not disclose a drain opening in the nozzle head to prevent nozzle dripping or other problems. Prior art of record does not disclose or suggest a system or a semiconductor substrate processing apparatus comprising, among others, a dispense head having a passageway (a bottom piece), an inlet opening, an outlet opening, wherein the passageway has a bottom, the inlet opening is at a first height above the bottom of the passageway (the bottom piece), the at least one outlet opening is at a second height above the bottom of the passageway (the bottom piece), the second height being less than the first height, and the drain opening is at a

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third height above the bottom of the passageway(the bottom piece), the third height being less than the second height.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM-4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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